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Food Demand in Indonesia

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ABSTRACT

The research of food consumption in Indonesia used the 2015 SUSENAS (Indonesian National Socioeconomic Survey) data from the Central Statistics Agency of Indonesia. The LA-AIDS (Linear Approximation-Almost Ideal Demand System) model with the application of Seemingly Unrelated Regression (SUR) was used to estimate the food demand in Indonesia. The results showed that price elasticity were inelastic for food commodities (rice, corn, cassava, sweet potato, and beef). Meanwhile, the cross elasticities tended to have a substitution relationship respectively, but the expenditure elasticity indicated that all food commodities were normal goods. The findings suggest that the government needs to apply policies to support production and price stabilization as the steps to maintain food consumption needs.

Keywords: Food Demand, Food Policy.

1. INTRODUCTION

Food world consumption is estimated to increase twofold because the increase of world population is relatively high especially in the developing countries and this will cause the shortage of food all over the world. The estimation of world food balance in the year 2025 will bring about a deficit of about 68.8 million tons. The South Asia and the South East Asia will have a deficit food consumption of 126.9 million tons (World Bank, 2016). Also, in the estimation of FAO (2010) about 900 million population will have a food insecurity.

Indonesia as one of the South East Asia Countries is estimated to have a deficit food production and will have a food insecurity if Indonesia does not attain an increase in food production. In year 2016 the Indonesian production of rice, corn and beef were 48.1 million tons, 106.88 million tons and 60.49 million tons respectively where each of them experienced a surplus production of about 0.6%, 1.4% and

3%, respectively. So in the future Indonesia should increase the food production as the projected increase of the population takes place.

At this time, the total population of Indonesia is 257.9 million. Taking cognizance of the population growth which is 1.176% per year, the projected population in 2025 will estimate to be 301.5 million. This condition will increase the food consumption and production to around 17%.

Therefore, the government needs to prepare the possibilities for the provision of food insecurity.

The experience of Indonesian food insecurity has been witnessed twice as a result of the economic crisis in 1997/1998 and the increase of oil price in 2004. During, the aforementioned crisis, the people could not capable to buy food. In the year 1999, the proportion of household with food insecurity was about 14.2% and in the year 2008, it declined to 8.7%. The research of Hardono (2012) used the micro-data of a farmer's household, the food insecurity again increased from 28.15 year 2007 to 60.3% in 2010. This situation showed that income has determines the consumption pattern in Indonesia.

Therefore the food consumption is the important factor to consolidate the food security in Indonesia. By knowing the people food consumption pattern, the government could establish policies related to supplying and distributing food so that people could assess the availability of food.

2. THEORETICAL FRAMEWORK

2.1. Almost Ideal Demand System (AIDS)

In contrast to other models of demand, this model is able to respond to the demands of consumer preferences, and its functional form is more flexible. This is caused by the restrictions of this model such as additivity, homogeneity, and symmetry, which can be statistically tested (Deaton and Muellbauer, 1980). In addition, this demand model also considers consumer decisions in determining a set of simultaneous commodities. This is not found in other models of demand, and thus a two-way cross relationship between two commodities can be determined. This is in accordance with the existing fact that the choice of a commodity is selected by consumers simultaneously (Anindita, 2004).

According to Deaton and Muellbauer (1980), several important characteristics of the AIDS demand model are that this model (1) is a first-order approach for a demand system of arbitrary functions, (2) can precisely fulfill behavioral axioms of commodity selection, (3) may be used to test homogeneity and symmetry restriction (4) has function forms that are consistent with household expenditures, (5) can aggregate household behaviors without applying linear Engel curves, and most importantly has parameters that are easily deduced without having to use nonlinear methods.

This model is the first-order approach of a demand function with the initial point being a specific preference class. This class according to the theory of Muellbauer (1980) allows for precise aggregating from consumers, as the picture of market demands that are a result of rational decision-making from consumers. This preference class is known as a PIGLOG Class, shown through functions of costs or expenditures, which determines the minimum spending required to achieve a specific level of utility at a certain price level. We may notate this function as $c(u, p)$ where u is utility and p is the vector of price, and define the PIGLOG Class as:

$$\log c(u, p) = (1 - u) \log [a(p)] + u \log [b(p)] \quad (1)$$

Where it is required that u is between 0 (subsistence) and 1 (luxury) so that the homogeneous positive linear functions of $a(p)$ and $b(p)$ can be said to be costs of subsistence and luxury. Next, special functions are used, as the functions of $\log a(p)$ and $\log b(p)$. So that the resulting cost function becomes a flexible form, the functions must possess a number of sufficient parameters, so that for any point, derivatives of $\delta c / \delta p$, $\delta c / \delta u$, $\delta^2 c / \delta p_i \delta p_j$, $\delta^2 \delta u \delta p_i$, and $\delta^2 c / \delta u^2$ may be considered the same as variable cost functions. For that, the following is used:

$$\log a(p) = \alpha_0 + \sum_k \alpha_k \log P_k + 1/2 \sum_k \sum_j \gamma_{kj}^* \log P_k \log P_j \quad (2)$$

$$\log b(p) = \log a(p) + \beta_0 \Lambda_k P_k^{\beta_k} \quad (3)$$

The AIDS cost function may then be written as:

$$\log c(u, p) = \alpha_0 + \sum_k \alpha_k \log P_k + 1/2 \sum_k \sum_j \gamma_{kj}^* \log P_k \log P_j + u \beta_0 \Lambda_k P_k^{\beta_k} \quad (4)$$

It can easily be checked that $c(u, p)$ is homogenous and linear in p , as the depiction of preferences, which is fulfilled by:

$$\sum_i \alpha_i = 1, \sum_j \gamma_{ij}^* = \sum_k \gamma_{kj}^* = \sum_j \beta_j = 0$$

The demand function can be directly derived from equation (4). A cost function has a fundamental attribute where if the function is derived with respect to price, then this results in the amount of requested commodities.

$$\frac{\delta c(u, p)}{\delta P_i} \times \frac{p_i}{c(u, p)} = Q_i \quad (5)$$

When both sides are multiplied by $P_i / c(u, p)$, this results in:

$$\frac{\delta \log c(u, p)}{\delta \log P_i} = \frac{P_i Q_i}{c(u, p)} = W_i \quad (6)$$

W_i is the proportion of expenditure of commodity i , and thus the logarithmic derivation of equation (4) with the proportion of expenditures as a function of price and utility is:

$$W_{i(u, p)} = \alpha_i + \sum_j \gamma_{ij} \log P_j + u \beta_i \beta_0 \Lambda_k P_k^{\beta_k} \quad (7)$$

Note:

$$\gamma_{ij} = 1/2(\gamma_{ij}^* + \gamma_{ji}^*) \quad (8)$$

To maximize consumer utility, total expenditure X must be equal to $c(u, p)$ and this equation can be inverted to obtain u as a function of P , and X is the indirect function of utility. If we do this to equation (4) and substitute the results (6), we will obtain the AIDS demand function in the form of the proportion of expenditures.

$$W_i(p, x) = \alpha_i + \sum_j \gamma_{ij} \log P_j + \beta_i \log (X/P) \quad (9)$$

Note: X/P is income divided by price index P .

Price index P is defined:

$$\log P = \alpha_0 + \sum_k \alpha_k \log P_k + 1/2 \sum_k \sum_j \gamma_{kj}^* \log P_k \log P_j \quad (10)$$

Thus the general form of the AIDS demand model is:

$$W_i = (\alpha_i - \beta_i \alpha_0) + \sum_j \gamma_{ij} \log P_j + \beta_i (\log X - \sum_k \alpha_k \log P_k - \frac{1}{2} \sum_k \sum_j \gamma_{kj}^* \log P_k \log P_j) \quad (11)$$

Equation (11) presents a consistent demand function if it fulfills the following restrictions:

$$\text{Adding up:} \quad \sum_i \alpha_i = 1, \sum_i \gamma_{ij} = 0, \sum_i \beta_i = 0 \quad (12)$$

$$\text{Homogeneity:} \quad \sum_j \gamma_{ij} = 0 \quad (13)$$

$$\text{Symmetry:} \quad \gamma_{ij} = \gamma_{ji} \quad (14)$$

From equation (11) it can be seen that the AIDS model is a nonlinear model due to the use of the price index P . Thus, in order to be estimated linearly, an approach needs to be conducted on index value P by exploiting the collinearity relationship among prices, one way of which is by using the Stone Index ($\log P^* = \sum_k W_k \log P_k$), making the AIDS model as:

$$W_i(p, x) = \alpha_i + \sum_j \gamma_{ij} \log P_j + \beta_i \log (X/P^*) \quad (15)$$

Note: $\alpha_i^* = \alpha_i - \beta_i \log \sigma$, apabila $P = \sigma P^*$

The above function is called the linear approximation of AIDS.

Deaton and Muellbauer (1980), applied this model to a time series in order to find the equation of demand of eight groups of consumption items (food and non-food) and this was estimated using Ordinary Least Squares (OLS). Rusniawan (1993) in a research using the SUSENAS 1990 cross-section, explained that the use of Seemingly Unrelated Regression (SUR) was more efficient than Ordinary Least Squares (OLS). This research on the application of the AIDS model in household consumption for non-food commodities included the parameter of the number of family members into the model.

2.2 The Attributes of the Demand Function

Demand for a commodity is certainly affected by many factors simultaneously. Put simply, Deaton and Muellbauer (1980) explained that in purchasing a number of commodity i , a consumer will surely be affected by the price of the commodity (p) and the total expenditure (x) (as an approach from income), and when written, the function becomes:

$$q_i = q_i(x, p)$$

The function above is called the “Marshallian demand function”. Several other factors that affect demand include among others the prices of other commodities, tastes, income distribution, number of population, consumer welfare, and government wisdom. In traditional demand theory, the factors that affect demand are emphasized on four items, which are the price of the commodity in question, the prices of other commodities, consumer income, and tastes (Kuntjoro, 1984).

Deaton and Muellbauer (1980) have summarized several attributes of the Hicksian and Marshallian demand functions:

- (a) **Adding Up:** The total value or sum of demand (both the Hicksian and the Marshallian demand functions) is the total expenditure of a household in consuming goods and services. From equation (x) above, the following function is obtained:

$$\sum_{i=1}^n P_i g_i(x, p) = x$$

The above equation explains the restriction of adding up.

- (b) **Homogeneity:** The Hicksian demand function will be homogenous with a degree of zero toward price, while the Marshallian demand function will be homogenous with a degree of zero toward price and household expenditures. This shows that for the Marshallian demand function if price and expenditures change proportionally, household demands of goods or services will not change.
- (c) **Symmetry:** The reduction of the cross-price coefficient from the Hicksian demand function is symmetric. The symmetry here shows that the resulting cross price coefficient is the same. This attribute is a guarantee of the method to test the axiom that states that consumers are consistent in determining their preferences.
- (d) **Negativity:** Between the price of a commodity and the demand value, there will be a negative relationship. This is in line with what is stated in the law of demand, and thus if the price of an item increases with utility being assumed constant, then the demand for the item will decrease.

From these four attributes, it can be concluded that the attributes of adding up and homogeneity are the consequences of the linear budget control specification. The attributes of symmetry and negativity are the consequences of a consistent consumer preference. Without these two attributes, consumers are not consistent toward their choices.

3. METHODOLOGY

3.1. Data Source

This research used household food consumption data in Indonesia, taken from the SUSENAS in 2015.

3.2. Analysis Method

3.2.1. Almost Ideal Demand System (AIDS) Model

The mathematical model used was the linear approximation of the AIDS model (LA/AIDS, Linear Approximation/Almost Ideal Demand System):

$$W_i = a_i + \sum_j \alpha_{ij} \log p_j + b_i \log(x/p^*) + \mu_i$$

Notes:

W_i : Proportion of the i^{th} food expenditure toward the total food expenditure ($i = 1, 2, 3, \dots, 6$)

P_j : Price of the j^{th} food commodity ($j = 1, 2, 3, \dots, 6$)

x : Total food expenditures of a household

p^* : Stone Index

a : Intercept parameter

b : Expenditure parameter

c : Price parameter

μ_i : Error term ($i = 1, 2, 3, \dots 6$)

where, 1 = rice, 2 = fresh corn, 3 = dried corn, 4 = cassava, 5 = sweet potato, 6 = beef respectively for national and regional (village, city).

To ensure that the assumption of maximizing satisfaction is not violated, there are three restrictions that must be inserted into the model:

1. **Adding-up:**

$\sum_i a_i = 1, \sum_i a_{ij} = 0, \sum_i b_i = 0$, allows an expenditure share of a single value.

2. **Symmetry:**

$C_{ij} = C_{ji}$ shows the consistency of consumer's choices.

3. **Homogeneity:**

$\sum_j c_{ij} = 0$, which is based on the assumption that changes are proportional in to all prices and expenditures do not affect the number of purchased items.

3.2.2. Formation of Aggregate Prices and the Stone Index

This is obtained by dividing total household expenditures for commodity i (in rupiahs) by the total sum of commodity i being consumed (in kilograms). In this case, the household in consideration is the household that consumes the commodity i . To obtain the Stone Index, the following formula is used:

$$\log p^* = \sum w_k \log p_k$$

where,

p : Stone Index

w_k : Proportion of the i^{th} food commodity in a group of several foods, obtained by dividing the expenditure value of the i^{th} food commodity into the group expenditure value.

p_k : Price of the i^{th} food commodity in each group, obtained by dividing the expenditure value by the quantity value. This results in the aggregate price for the i^{th} food commodity.

3.2.3. Marshallian and Hicksian Elasticities

Marshallian elasticities (*uncompensated elasticity*) include price effect and income, which are estimated using the parameters of the AIDS model (Hayes *et. al.*, 1989):

$$e_{ii} = 1 + \left(\frac{\gamma_{ij}}{w_i} \right) - \beta_i \quad \text{price elasticity}$$

$$e_{ij} = \left(\frac{\gamma_{ij}}{w_i} \right) - \beta_i \left(\frac{w_j}{w_i} \right) \quad \text{cross elasticity}$$

$$\eta_i = 1 + \left(\frac{\beta_i}{w_i} \right) \quad \text{expenditure elasticity}$$

The hicksian price elasticity (*compensated elasticity*) depends on price effect (Koc and Alpay, 2002):

$$e_{ij} = \varepsilon_{ij} + \eta_i \times w_i \quad \text{hicksian price elasticity}$$

w_i is the budget share average, while β_i and γ_{ij} are estimation parameters.

4. RESULTS AND DISCUSSION

4.1. Food Demand in Indonesia with the AIDS (*Almost Ideal Demand System*) Model

Food demand in Indonesia in the year 2015 was estimated with the AIDS function and also uses a number of restrictions tests from the theory of consumer behavior, which are the homogeneity, symmetry and adding up restrictions for the aggregate demand functions. The results of the wald-test showed that the model of food commodity demand in 2015 comply with the restriction assumption, see Table 1.

Table 2 shows the function parameters of food demands in Indonesia in year the 2015. The coefficients of determination R^2 in the demand model for rural and urban regions, which were 0.747 and 0.6530, showed that the decisions to consume food commodities was very much affected by other food commodity prices as well as the level of income. Next, the suspected variable for expenditures of food commodities that had a significance value of less than 10% showed that the making of food commodity consumption decisions was very much affected by the size of income, where the positive sign in the equation shows that if increases occurred in the income of the people, consumption of plant food commodities will also increase. Conversely, a negative sign in the equation shows that the proportion of demand for food commodities will decrease along with a decrease in the level of income.

Table 1
Wald Test Statistic for Testing Homogeneity and Symmetry of the Model

<i>Restriction</i>	<i>Wald Test Statistic</i>	<i>Degree of Freedom</i>	<i>p-value</i>
<i>Rural</i>			
Homogeneity	0,00	7	0,9591
Symmetry	0,82	5	0,3649
<i>Urban</i>			
Homogeneity	0,43	7	0,5129
Symmetry	0,78	5	0,1284

Specifically, for the commodity of sweet potatoes, whether for rural and urban regions, it was shown that changes in the incomes of people did not affect changes in the commodity's consumption, while the consumption of beef in both rural and urban regions showed that changes in incomes did have an effect on the size of consumption of beef; this change shows that there were changes in preferences and consumption behaviors of people in Indonesia for food commodities. The positive sign in the equation shows that increases occurring in the income of the people will increase consumption of food commodities, in particular, plant foods. Conversely, a negative sign in the equation shows that the proportion of demand for food commodities will decrease along with decreasing levels of income.

The system of rice demand can be seen from the calculation of price elasticities, cross-elasticities, and expenditure elasticities, because elasticities can show the response of households or consumers toward changes that will affect prior consumer decisions, such as level of income, commodity prices, tastes, and so on (Utari, 1996). The results of the estimations of price elasticities are presented in Table 3.

Price elasticities for food commodities in 2015 in rural and urban regions ranged from -1.77 to 0.99 which showed that food commodities (rice, fresh corn, dried corn, cassava, sweet potatoes, and beef) were inelastic. Changes in the demand of for food were smaller compared to changes in the prices of those food commodities, which means that demand for food commodities is not significantly affected by price changes. Thus the inelastic nature of food commodities shows that the response of households toward food commodities is still low. The cross elasticity value shows that most of the relationships between food commodities in both rural and urban areas have a complementary relationship, which is shown by the negative sign of the cross elasticity values of most commodities.

Table 2
Parameters of the Function of Food Demand in Indonesia, 2015

	<i>Rice</i>	<i>Fresh C</i>	<i>Dried Corn</i>	<i>Cassava</i>	<i>Sweet Potato</i>	<i>Beef</i>	<i>Total Expenditure</i>
<i>Rural</i>							
Rice	0.064	-0.001	0.001	0.009*	-0.076	-0.00009	0.407
Fresh Corn	-0.001	0.0001	-0.00002	0.0002	-0.0001	0.0001	-0.0002
Dried Corn	0.001	0.0002	0.0006	0.002	-0.001	0.001	-0.006
Cassava	0.009	-0.0004	-0.0001	0.004	0.003	0.0005	-0.011
Sweet Potato	-0.075	0.0004	-0.002	-0.015*	0.072	-0.002	0.185
Beef	-0.0001	0.00004	-0.00001	-0.00001	0.00004	0.001	-0.00005
<i>Urban</i>							
Rice	0.005	0.0002	-0.00003	-0.001	-0.003	-0.001	0.000082
Fresh Corn	0.0002	0.0003	0.00005	-0.0003	0.0003	-0.0001	-0.0003
Dried Corn	-0.00003	0.000009	0.0002	0.000006	0.0001	0.00003	-0.00074
Cassava	-0.001	0.000006	-0.0001	0.002	0.00003	-0.00005	-0.0002
Sweet Potato	-0.003	-0.0007	0.0002)	-0.0007)	0.002	-0.0002	0.003
Beef	-0.001	0.0002	-0.0002	0.0003	0.0006	0.002	0.002

The changes in the elasticity of demand for food commodities in Indonesia due to changes in preferences and consumption of the people can be seen in Table 2.

These changes in relationships between food commodities indicate the occurrence of changes in the aggregate consumption of people on food commodities. This is affected in part by the food diversification conducted by the people. In addition, changes in demography, such as level of education, the rate of urbanization, and level of participation of women in the work-force accompanied by current advances in transportation and communication, also affect consumer preferences. Consumers emphasize more on a balance of quality, nutrition, and aesthetics. Meanwhile, the increased participation of women in the workforce, in particular in urban regions, drive consumers to choose food products that are packaged in a way that they make consumers feel comfortable in when shopping, are easy to cook, and are easy to prepare.

To compare demand elasticities for food commodities in Indonesia, the analytical calculations of Hicksian demand elasticities were also performed, and this is presented in Table 4.

Table 3
Marshallian Elasticities of Demand for Food Commodities in Indonesia

	<i>Rice</i>	<i>Fresh Corn</i>	<i>Dried Corn</i>	<i>Cassava</i>	<i>Sweet Potato</i>	<i>Beef</i>
<i>Rural</i>						
Rice	1.6952638	0.7595608	0.7595545	-2.1895110	-5.1029969	-11.8075180
Fresh Corn	-2.1840258	1.0000315	-0.0116159	-100.1749755	-199.1411972	-426.8825094
Dried Corn	-4.3196841	0.0005266	1.0000998	-198.1520742	-393.9136150	-844.4005528
Cassava	31.9192383	31.9193215	31.9193214	32.8599529	31.9117415	31.9030729
Sweet Potato	63.4899321	63.4907251	63.4907250	63.4543557	64.3628696	63.3357417
Beef	138.6643732	138.6643802	138.6643802	138.6640597	138.6637430	134.1074587
<i>Urban</i>						
Rice	1.3356078	0.3406926	0.3407040	-2.3092502	-0.9112798	-1.2377742
Fresh Corn	-1.4229664	1.0000664	0.0001571	-58.6580224	-27.7131005	-34.9402508
Dried Corn	-6.7900948	-0.0011962	1.0000068	-279.8425087	-132.2129574	-166.6916664
Cassava	13.8606854	13.8607271	13.8607271	14.8034525	13.8599149	13.8597031
Sweet Potato	6.5641009	6.5641922	6.5641922	6.5604289	7.5068587	6.5619505
Beef	8.2681578	8.2682272	8.2682272	8.2653699	8.2668772	9.2109696

Table 4
Hicksian Elasticities of Demand for Food Commodities in Indonesia

	<i>Rice</i>	<i>Fresh Corn</i>	<i>Dried Corn</i>	<i>Cassava</i>	<i>Sweet Potato</i>	<i>Beef</i>
<i>Rural</i>						
Rice	1.6952638	0.7595608	0.7595545	-2.1895110	-5.1029969	-11.8075180
Fresh Corn	-2.1840258	1.0000315	-0.0116159	-100.1749755	-199.1411972	-426.8825094
Dried Corn	-4.3196841	0.0005266	1.0000998	-198.1520742	-393.9136150	-844.4005528
Cassava	31.9192383	31.9193215	31.9193214	32.8599529	31.9117415	31.9030729
Sweet Potato	63.4899321	63.4907251	63.4907250	63.4543557	64.3628696	63.3357417
Beef	138.6643732	138.6643802	138.6643802	138.6640597	138.6637430	134.1074587
<i>Urban</i>						
Rice	1.3356078	0.3406926	0.3407040	-2.3092502	-0.9112798	-1.2377742
Fresh Corn	-1.4229664	1.0000664	0.0001571	-58.6580224	-27.7131005	-34.9402508
Dried Corn	-6.7900948	-0.0011962	1.0000068	-279.8425087	-132.2129574	-166.6916664
Cassava	13.8606854	13.8607271	13.8607271	14.8034525	13.8599149	13.8597031
Sweet Potato	6.5641009	6.5641922	6.5641922	6.5604289	7.5068587	6.5619505
Beef	8.2681578	8.2682272	8.2682272	8.2653699	8.2668772	9.2109696

The results of calculations of Hicksian demand elasticities showed that both rural and urban regions have a positive value, shown by the tendency of elasticity values to have a positive sign. Meanwhile, the cross-elasticities of Hicksian showed that among food commodities in general, there was a substitutive relationship but the cross-elasticities of Marshallian was a complement relationship. This means that the effect non-price has a greater impact to on the consumer preference.

Table 5
Expenditure Elasticities of Food Commodities in Indonesia

	<i>Rice</i>	<i>Fresh Corn</i>	<i>Dried Corn</i>	<i>Cassava</i>	<i>Sweet Potato</i>	<i>Beef</i>
			<i>Rural</i>			
Expenditure	1.0924831	4.1414939	7.2140767	1.0001196	1.0011405	1.0000101
			<i>Urban</i>			
Expenditure	1.015184	5.241009	21.232667	1.000124	1.000272	1.000207

The value of income elasticity for food commodities in Indonesia showed a positive value. This means if consumer income increases, then the demand for food commodities will also increase. Income elasticity showed that food commodities in Indonesia are normal goods, which shows that the changes in their demand correspond with changes in the income of people, as presented in Table 4. The highest value of income elasticity was for dried corn and the lowest was for beef, but the entire value of income elasticity was greater than 1, which showed that food commodities in Indonesia are still considered luxury goods. The rise in income will also increase the food consumption of the Indonesian people.

4.2. Policy Implications

Several policy implications arise from this research, covering price policies for consumers and price policies that are oriented to income that effectively affects the consumption patterns of people. This is in line with the research results of Anindita *et. al.*, (2016) in that an increase in prices of rice and corn by 10-20% will positively affect self-sufficiency but a higher increase is detrimental to consumers. Some of the policies that may be implemented cover (1) price policies for consumers that maintains a lower food price for consumers because the proportion of consumer income in rural and urban areas is still very much used for determining food consumption by looking at the values of price elasticity and income elasticity, which in this case is relatively large (greater than 1) — too high of an increase in food prices will tend to deplete incomes for food consumption; (2) implementation of policies of price incentives for producers to maintain relatively lower producer prices, making food prices relatively affordable by consumers; and (3) inclusion of the meat sector as part of food policies, given the relatively high value of income elasticity for meat.

5. CONCLUSION

The results of the research showed that based on Marshallian demand elasticities, food commodities in Indonesia were inelastic. Meanwhile, the cross elasticities showed the occurrence of a shift of relationships from complementary to substitutive, caused by changes in patterns of consumption by the people. Meanwhile, Hicksian demand elasticities showed that food commodities in Indonesia were elastic and have a substitutive relationship between food commodities. Next, based on income elasticities, food commodities in Indonesia are normal goods, and thus increases in food prices affect the expenditure of consumption from the income of people.

From the discussion above, it can be suggested that the government needs to maintain food prices relatively low and affordable for the people.

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